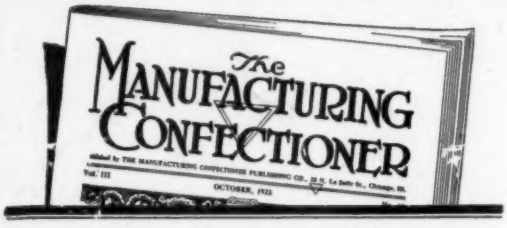
EDITORIAL



EARL R. ALLURED, Editor - Publisher

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A Specialized Technical and Commercial Magazine for Confectionery Superintendents, Purchasing Agents and Executives.

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Phone: Cortland 5126

Progress in Production Methods

The confectionery industry has made a lot of progress the past decade in manufacturing methods which have not only lowered production costs but also reduced sanitary hazards and contributed to a higher standard of purity and uniform quality of our manufactured goods. We've seen the development of automatic equipment for wrapping and packaging, for spinning and forming hard candies, for rolling and forming centers, conveyors for all kinds of material handling. Modern cooling tunnels and air conditioning equipment for chocolate coated work have put the old plaque and rack system among the antiques. The mogul has speeded production and lowered costs in the starch room, but still the whole starch department has been a heavy drag on the overhead of the individual plant, because of floor space occupied by dry rooms and starch boards, and to quite a degree, a discredit to the candy industry from standpoint of cleanliness and sanitation. Neither the baking, canning, biscuit nor ice cream industries have any process which compares to the working conditions in the average starch department of a candy plant with its dust and general mussiness to say nothing of lack of control of the bacterial content of the starch. But modern engineering has finally come to the rescue. Starch can now be conditioned—temperature and moisture content controlled to a tenth of a degree and sterilized—in less than ten minutes ready to receive deposits of more cream or marshmallow or gum work, as the case may be. Dry rooms will still be used for goods requiring longer time to set in starch but not for conditioning the starch.

Our industry should rejoice in this forward development which further fortifies the position of the commercial manufacturer—the legitimate confectionery factory proper—against the home-made candy kitchen competition.

Candy for the Bones

Would you expect that the fluid of the bones is fed directly by sugar—the chief content of candy—and that when this sugary fluid becomes deficient then disease begins to attack the bones?

Dr. Ralph Pemberton of Philadelphia, writing in *Science*, states that the sugar we eat has a definite bearing on the ability of bones to resist infection. In more than sixty patients afflicted with diseases of the joints he found a low tolerance for sugar. The amount of sugar digested in the body, he states, has a well-defined relationship to joint inflammation. He believes the control of sugar is a factor in the determination of such diseases, and that the trouble comes from too little sugar, not too much.

Dr. Pemberton found that sugar, taken through the mouth, is carried from the stomach into the blood stream to the joints, where it is used to build up disease resistance.

For the same reason the canner uses enough sugar to preserve fruits, etc. That is commonly known in the case of the kitchen preserver. Too little sugar in jams and jellies spoils them because of bacterial invasion. The candy maker knows, too, that weak sugar solutions are ideal for bacteria growth. Sugar in the body evidently fortifies our physical being in the same corresponding way against disease germs.

The Peppermint Situation—Again

Settling Back to Calicos

Settling Back to Calicos

SETTLING back to calicos after a night in silks and satins is a harrowing ordeal for our modern Cinderellas, the peppermint growers. It was to be expected that they would resist every inch of the way, their sorrowing return to normal market conditions. At this very moment their representatives are in Washington lobbying to enlist official support for a still higher duty on Japanese peppermint oil. They insist that the duty be made high enough to entirely eliminate competition from cheaper materials. And in the next breath, they say that American peppermint will never be sold at a price lower than Japanese peppermint can be brought in for, if they can help it. What matchless logic.

To quote from one of the broadsides of the St. Joseph Valley Co-operative Association (published in these columns last month):

> **"THERE IS NO OVER-SUPPLY OF OIL . . . Normally we have a carry-over of from 15 percent to 25 percent of old crop. Last year we had such a carry-over. This year we have no carry-over. The consumers' drums are dry . . . They will consume more oil this year than last year. The best information this year is that the production this year will not exceed last year's by over 30 percent. Without the carry-over it means practically the same supply as last year."**

If it is true that there is no over-supply of oil and that conditions in the peppermint market are practically a repetition of last year, why all the anxiety over Japanese oil? Wasn't it sufficient that the Department of Agriculture forbade its being marketed as peppermint oil? Weren't last year's prices satisfactory to everybody but the consumer?

We'll Be Ham-strung if They Do; Ham-strung if They Don't

After reading all the published reports on the subject it is evident that the peppermint market has settled down to a fight between two factions, neither of which gives a damn about the consumer. The "speculative" element, which the Association keeps waving at the farmer the way Geo. M. Cohan waved the American flag, is doing everything possible to force prices *down* so that they can get their hands on a supply of oil which will later enable them to force prices *up*. Their field agents are spreading the propaganda of an enormous crop ranging all the way from 750,000 to a million pounds! It is their persistent short-selling which brought the market for the natural oil down to the $5.50 and $6.00 levels. The Association, on the other hand, is trying to get prices up right from the very beginning so as to maintain the corner which they now possess. Their estimate of the crop is only 450,000 pounds.

It will be observed that both factions have the ultimate aim of higher prices, so that as usual, the consumer is left to do his own guessing about the actual size of the crop.

According to the United States Bureau of Agricultural Economics, co-operating with Purdue University Agricultural Experiment Station, the peppermint crop statistics for the past two years are as follows:

	1926	1925	% Increase
TOTAL plantings, Michigan and Indiana	58,600	57,900	2 %
Acreage for harvest	51,400	25,390	102½%

The indicated harvest acreage of 51,400 acres for 1926 is *more than double* the acreage which survived to reach harvest during 1925.

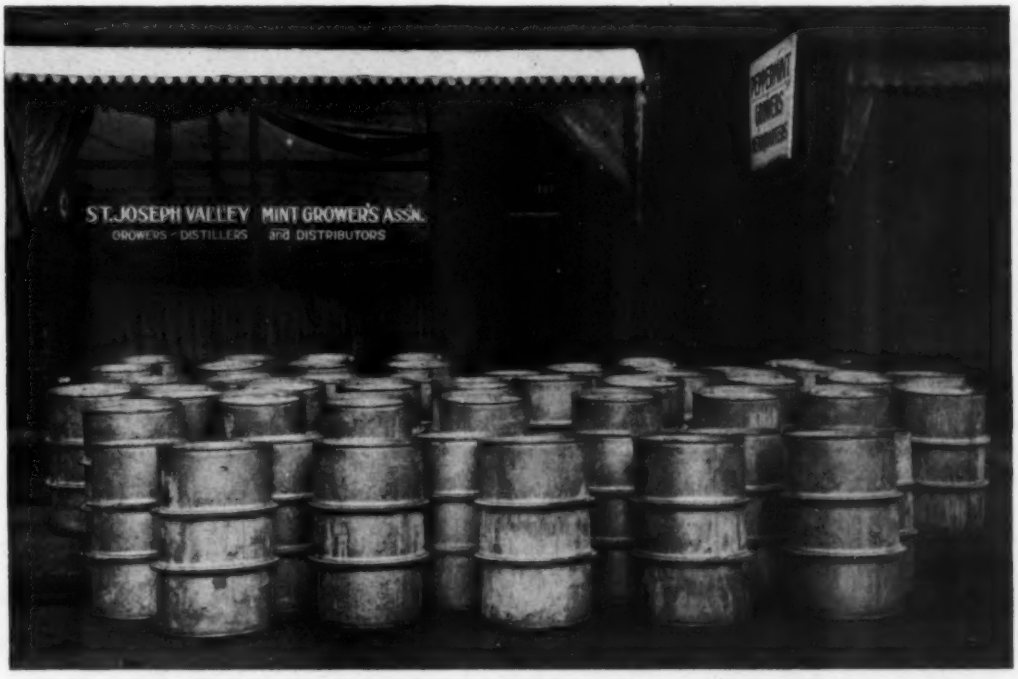
The average yield of oil reported for these districts for 1925 was 13 pounds to the acre, giving a total production of approximately 330,000 pounds. A normal yield being around 20 to 25 pounds to the acre, this was cited as a phenomenally low figure caused by the exhaustion of the soil through over-cropping and a whole string of unfortunate weather conditions. According to the St. Joseph Valley Mint Growers' Co-operative Association, this year's yield started off around 17 and 18 pounds to the acre, but excessive rains caused it to tail off to about 8 pounds to the acre. It is from this lower figure that they argue a production for the year of around 450,000 pounds.

But with all due allowance for lighter distilling returns toward the end of the season, it is difficult to see how the *average* yield under the more favorable circumstances of the past crop year can come anywhere near the record low yield of 13 pounds to the acre for 1925. And even a thirteen-pound yield would give us 650,000 pounds in Michigan and Indiana alone. Increases in the minor producing fields, New York, Northern California, Washington and Oregon, should bring the production for these sections well up to 30,000 to 40,000 pounds additional.

It is becoming increasingly evident that production is larger than the co-operatives care to admit. Seventy-five per cent of this production they claim they control. As between the speculator, with recognized proclivities for taking money away from the consumer, and the South Bend Co-operatives who accomplish the same gentle feat by cornering seventy-five per cent of the country's supply, the consumer is hard pressed to distinguish any vital difference. A rose by any other name would smell as sweet.

The one new feature in the past two years' marketing of peppermint oil, is the readiness with which the banks have advanced money against stored peppermint stocks as collateral security. A tour of the banks in the peppermint districts reveals vault after vault filled with 400 lb. steel drums, valued at some $3,000 apiece. There are tons of the stuff thus secured against notes. And this is only a small fraction of what the farmers, not to mention the co-operatives, are hoarding themselves.

But the way of the speculator is hard. He loses as often as he gains. Guessing wrong in his operations brings down upon him a punishment more severe than he would receive at the hands of any court of justice. For the consumer, torn between two conflicting factions of money-grabbers, it is a test of endurance. And the notes . . . the notes . . . !



Mint oil in storage at "Peppermint Growers' Headquarters," South Bend

Utility of Edible Gelatine in Candy Making—I

Influence of Gelatine on Sugar Crystallization

The first report on special research being made on the physical properties of edible gelatine and their relation to other raw materials in the manufacture of confectionery

by Werner W. Duecker, Ph. D.

Essex Fellow, Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh, Pa.

IN the course of the writer's researches on problems of marshmallow manufacture, he had occasion, in one comprehensive set of experiments, to observe photomicrographically the influence of edible gelatine upon the crystallization of cane sugar.

Chemists have long known that certain colloidal substances, such as gelatine, which have the property of forming jellies, exercise a marked influence upon substances dissolved in these jellies. The ice cream maker has only recently come to realize how valuable these properties are and nearly all ice cream manufacturers use gelatine to insure a smooth and pleasing product.

The candy manufacturer appreciates some of the valuable properties of gelatine, because he uses it in the production of a foam that he calls marshmallow. But besides giving permanence to this confection, gelatine also prevents the formation of large sugar crystals in much the same way that it hinders completely the formation of large ice crystals in ice cream.

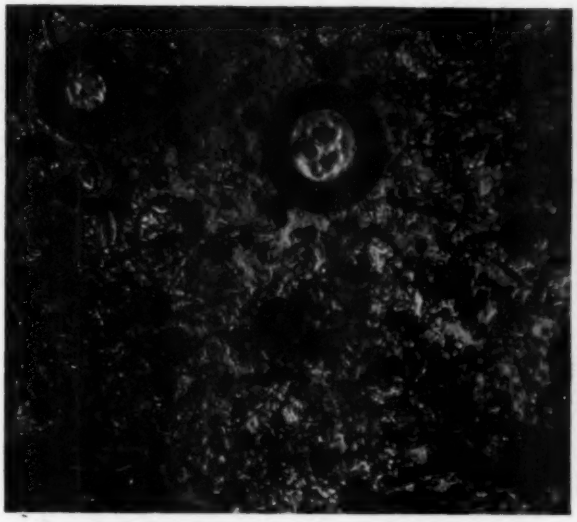
IN Fig. 1 is shown a series of photomicrographs which were made of four different marshmallows. These marshmallows were all prepared according to the same formula, but with varying quantities of gelatine. Reading from left to right, the first photomicrograph is that of a marshmallow made with 1.25% gelatine, the second with 1.5% gelatine, the third with 1.75% gelatine, and the fourth with 2% gelatine. On examining these pictures, there will be noticed first of all a number of small circles. These circles are the small air bubbles held in suspension—the air cells which give life to the marshmallow. Interspersed between the air cells are small platelets of sugar crystals. It will readily be seen that the marshmallow made with 1.25% gelatine is full of very fine crystals of sugar; the marshmallow made with 1.5% gelatine shows slightly less crystallization or graining, while the marshmallows made with 1.75% and 2% gelatine do not contain any sugar crystals at all.

FIG. 2 illustrates more definitely the extent to which gelatine retards the crystallization of cane sugar. The graining of marshmallow is influenced to some extent by certain other ingredients, such as glucose and invert sugar. This picture gives an idea of the extent to which gelatine alone influences the crystallization of sugar. All the bottles contained 70% of cane sugar, water, and varying percentages of gelatine, as indicated on the labels. Inspection of Fig. 2 is adequate to reveal the fact that 1.5% of gelatine practically prevented the crystallization of the sugar.

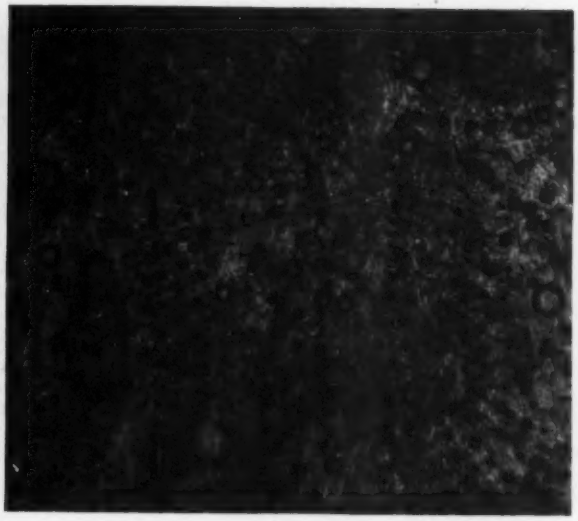
In order to obtain more definite information as to the extent to which gelatine retards crystallization, the sugar crystals which had settled out, in the bottles shown in Fig. 2, were removed and weighed. Table I gives the number of grams of sugar which had crystallized in each bottle.

Percentage of gelatine	Grams of sugar crystallized
0	13.5
0.15	14.
0.3	16.
0.45	18.
0.6	18.
0.75	17.
0.9	19.
1.	19.
1.2	17.5
1.35	12.5
1.5	4.5

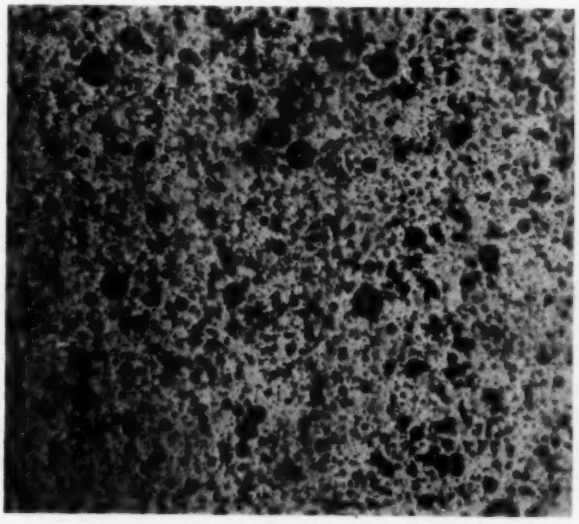
Fig. 1.—The influence of gelatine upon the graining of marshmallow.



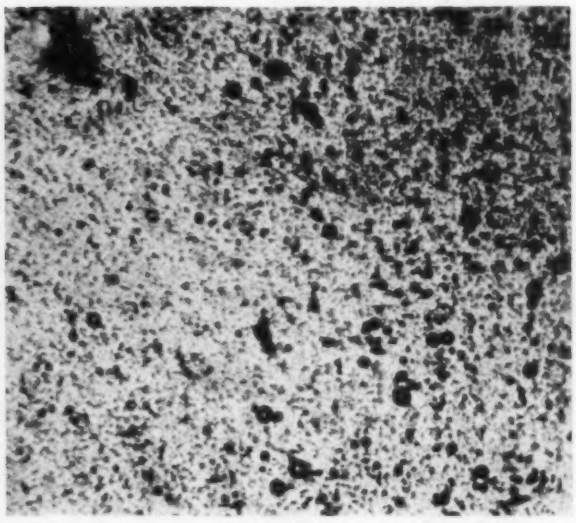
Photomicrograph of marshmallow made with 1.25% gelatine. The small circles are air bubbles.



This marshmallow made with 1.5% gelatine.



Marshmallow containing 1.75% gelatine.



2% gelatine in this marshmallow. Note absence of sugar crystal.

From these data it is evident that gelatine up to 0.9 to 1.0% increases crystallization, but that above this concentration it decreases crystallization. Not only does gelatine prevent crystallization, but on close inspection of Fig. 2, it will be seen that the crystals deposited in the bottles containing up to 0.45% gelatine are clear and bright, while the crystals in the bottles marked 0.6%-1.5% gelatine are cloudy. These cloudy crystals are made up of many small pieces. A small crystal was formed and started to grow, but the crystal, instead of forming or growing into a typical large crystal, encountered obstructions in certain lines of growth (due to the presence of the gelatine) and, although it tended to orient itself, it developed along the line of least resistance, and the result was a crystal structure composed of fine radiations from a central point. Such a crystal will naturally be soft.

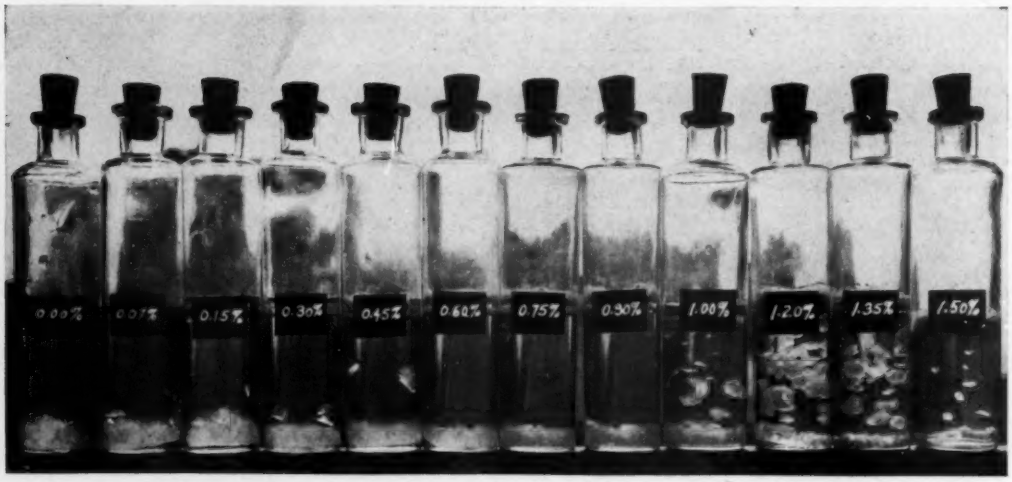


Fig. 2.—Influence of gelatine upon the crystallization of cane sugar.

FIG. 3 presents more clearly the scientific fact that gelatine will definitely prevent the crystallization of cane sugar.

Although gelatine has long been used for the stabilization of foams and emulsions, the candy manufacturer has not thoroughly appreciated the fact that gelatin will prevent the crystallization of cane sugar. According to the amount used, gelatine will either cause the deposit of a very fine, soft crystal, retard or altogether prevent crystallization. Other colloids, such as agar agar, gum tragacanth, and gum arabic, probably have the same influence, but of all the available colloids gelatine is of the greatest interest and utility to the candy maker, for the reason that when using edible gelatine of proper grade, it not only functions as a valuable colloid but the gelatine is a highly nutritious food.

At the present time, when foods are being discussed in nearly every magazine and newspaper, the public has come to realize the influence certain foods have upon well being. Candy is of course a food product, of definite value in the dietary. When the candy maker incorporates edible gelatine in his product, not only does he make the candy pleasingly smooth by preventing the crystallization or graining of sugar, but he is adding a substance that enhances the food value of confectionery, as has been demonstrated by the extensive investigations of Drs. P. B. Hawk, T. B. Downey, E. V. McCollum, and of other scientists.

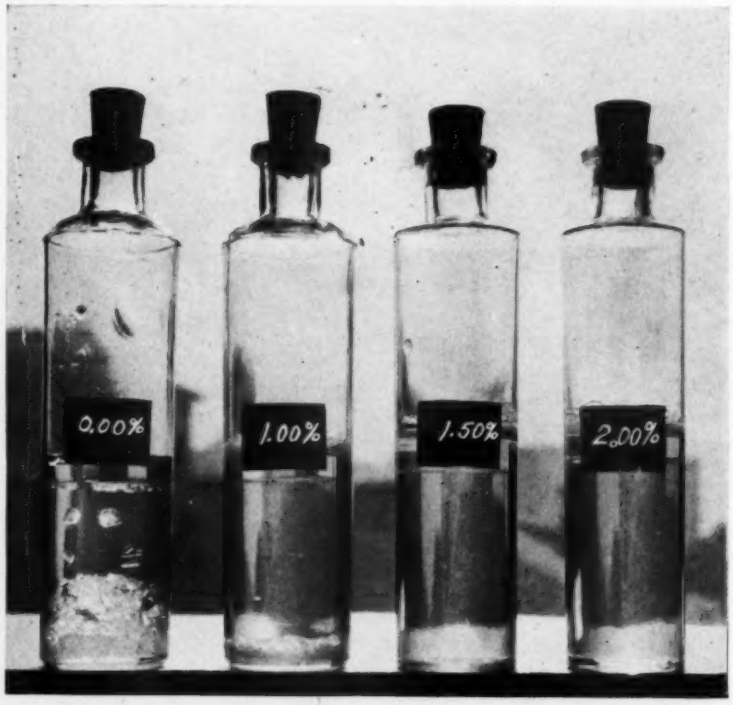
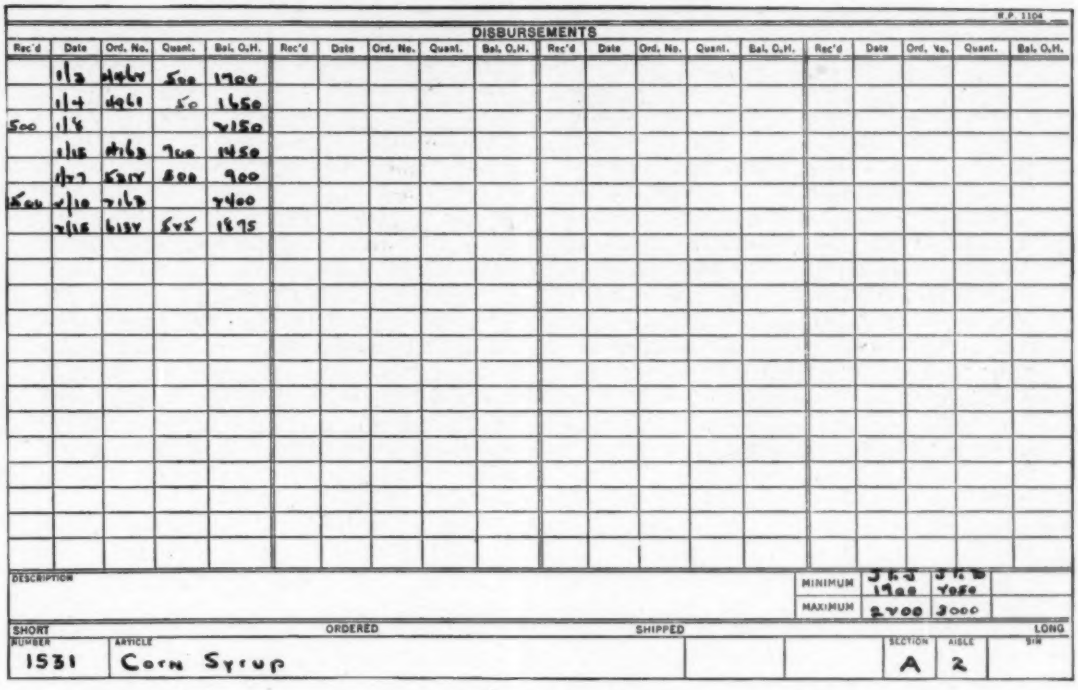


Fig. 3.—A demonstration of the fact that gelatine prevents crystallization of sugar.



W.P. 1104

DISBURSEMENTS

Rec'd	Date	Ord. No.	Quant.	Bal. O.H.	Rec'd	Date	Ord. No.	Quant.	Bal. O.H.	Rec'd	Date	Ord. No.	Quant.	Bal. O.H.	Rec'd	Date	Ord. No.	Quant.	Bal. O.H.
	1/3	4967	500	1900															
	1/4	4968	50	1650															
500	1/4			2150															
	1/15	4963	700	1450															
	1/17	5217	800	900															
6500	1/18	7163		7400															
	1/18	6137	525	1875															

DESCRIPTION

MINIMUM	J 6 J 1900	J 1 6 7050
MAXIMUM	2700	3000

SHORT — ORDERED — SHIPPED — LONG

NUMBER	ARTICLE			SECTION	AISLE	BIN
1531	Corn Syrup			A	2	

Executive Control of Stock

An Interview by D. B. Williams with

A. S. Colebrook

President, Rochester Candy Works

BOTH production and selling costs reflect directly on internal continuity. There must be a connecting link between these two elements—executive control is the solution. One of the first duties of an executive is to eliminate internal waste which includes loss of materials, time, space and money. Successful management methods and control are to a very large extent contingent upon records in use within various departments. Stock records clearly illustrate the principle; a carefully maintained and balanced stock record is just as essential to good management as the ledger; for, after all, materials represent money.

When stock and inventory records first came into common usage in the business world—and that was not so very long ago—their principal purpose was to show when stock was low so that a replacement order could be entered. In some businesses, this is the scope of the stock record of today. However, the progressive business man demands that there be a systematic control of stock. Many successful candy manufacturers and dealers have through well organized stock records, tripled their turnover.

Without stock control a plant or store suffers from shortage or overstock of materials. In some instances, these conditions have been considered as necessary evils. What do they mean? A shortage of materials means production loss, idle machines, idle labor, increased overhead—it also means loss in sales. Delay is a maker of dissatisfied customers. All of these conditions are fully realized by the large majority of manufacturers. As a result, the normal tendency is to overstock.

Overstocking is just as disastrous as understocking. It results in an increase in the investment involved, loss of interest on this additional investment, a greater fire risk, increase floor space for storage,

reduced stock turnover, a real likelihood of deterioration.

A Model Perpetual Inventory

The Rochester Candy Works of Rochester, N. Y., are operating a visible perpetual inventory control that makes overstocking and understocking almost an impossibility. It immediately signals the low limits and allows ample time to replenish stock. It eliminates overbuying by a pictorial control based upon comparative records of the previous movement of articles.

The Disbursements card is indexed according to number, article and location—which information appears in the visible margin of the card file—maximum and minimum figures being recorded.

The Purchase card carries space for article, specification, vendor, ordered, shipped, received, and monthly consumption information. This is filed directly above the Disbursements card, on the back of the preceding card holder.

As disbursements are made, a glance at the minimum figures will tell whether or not stock should be replenished. When an order is placed, it is recorded and followed through. This procedure is carried on by color flash information in the visible margin of the Disbursements card.

A color flash over the word "ordered" indicates that such a condition exists. When a shipping notice is received, the flash is moved so that it covers the word "shipped." In this way, it is always possible to give almost accurate information regarding the date stock will be on hand. However, unless there is an unusual demand for a particular article, there is little cause for running low on any item of stock. The minimum figures serve as danger signals and are always visible at the time of disbursement.

One of the conclusions reached in a study of the cost of merchandising distribution is that a reduction of the average inventory will increase the rate of turnover.

This perpetual inventory record reduces periodic inventory and increases turnover. If a certain article carried in stock does not move within a certain time, depreciation is bound to take place. Then, again, storage space is being taken away from those active items that mean quick money.

The record makes slow-moving items stand out by using the "off-set" feature, i. e., cards are shifted to one side of the card holder or the other. At the beginning of a year, all cards are in the left-hand position. As soon as disbursements take place, the cards are shifted to the right-hand position. Therefore, at the end of a specified period, it is possible to immediately distinguish all inactive items by merely glancing at the left-hand position cards.

How easy it is to forget certain articles carried in stock especially when they do not move, and there is a rush of business. Yet, all "dead" stock increases overhead, and, incidentally, cost of distribution.

The proper functioning of this record depends upon, to a large extent, the setting of the maximum and minimum limits. If these limits were lacking, there would be no adequate control of the quantities.

Without the proper maximum, the stock room would be very likely to have a year's supply where there should be but a month's supply. When a change in design or style is made, there would be a large amount of non-usable equipment in stock.

Without the proper minimum, the various departments would find no material on hand. If this matter were left to the judgment of the storekeeper, it would be found that oftentimes he errs by having too much, rather than too little material.

Correct maximum and minimum limits help every department, the Purchasing Department is able to buy with all facts before them, the Sales Department pushes articles on lines with full knowledge of stock conditions, the Financial Department does not find it necessary to tie up large funds in slow-moving stock.

Maximum and minimum limits are set for a definite period of time. If requirements warrant, they are changed. The practice is to set limits for definite periods of months, quarters, or years depending upon items concerned.

There are many factors considered in establishing maximum and minimum figures, the first of which is rate of consumption. This is found in the monthly disbursement totals, shown on the purchase record. Another factor is the time element—routine time in getting the actual purchase order made—and the time necessary to get the material in stock. This last period is governed by weather conditions, traffic conditions or location of vendor, market price, the number of vendors available, and the manufacturing process. The other important points considered are amount of cash involved, the storeroom space required and the quantities that can be purchased economically.

Of course, the proper setting of maximum and minimum limits is an important

factor in securing a better turnover of inventory. This turnover measures the rapidity with which stocks of goods are sold and replenished, and it is readily seen that the more rapid the turnover, the smaller the amount of capital needed to do a given volume of business. For, on each turnover, a margin of profit is realized, thus, the more frequent the turnover, the greater the profit. In addition, the rapid turnover enables the Purchasing Agent to keep close to the average market spread.

Inventory reductions can be governed by a close study of stock control and requirements. A careful check on maximum and minimum limits, with revisions whenever necessary, will usually decrease the inventory and increase the turnover materially. Items that can be restocked quickly without increased cost are stocked in as small quantities as is consistent with good business. Slow-moving items are signalled to call them to the attention of the Purchasing Agent. Re-orders on these items are smaller and the maximum and minimum re-figured. This is easily controlled by carrying on the purchase record —in the back of the preceding card holder —a figure representing the approximate monthly consumption. A comparison made when posting the monthly summary of disbursements shows how actual consumption tallies with the approximate figures.

Because of the centralized control resulting from this consolidation of all stock records and the co-ordinated purchase records, all details regarding any article carried are instantly available in one place. Facts are not duplicated; routine is decreased; entries are made but once; there is but one place to look for information.

This record is a modern stock-keeping system. It so visualizes operations that it instantly divulges complete information on every item of stock.

NO. 1531 ARTICLE Corn Syrup SEC. A SHELF Z BIN

SPECIFICATION No.

	VENDORS		VENDORS
1	J. A. Smith & Co. Boston, Mass	4	
2	Wright & Jones, Chicago, Ill.	5	
3	The United Syrup Corp., Louisville, Ky	6	

N. P. 1103

ORDERED								SHIPPED			RECEIVED			MONTHLY CONSUMPTION			
Date	Ven.	Order No.	Quantity	List	Disc.	FREIGHT RATE	DEL'D COST	Date	Quant.	Weight	Date	Quant.	Weight	No.	19'5	19	19
1/5/16	3	7163	1500	9.50	7/10		8.00	7/22/16	1500	74131	7/28/16	1500	74131	J	1406		
														F	1209		
														M	1317		
														A	1415		
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Announcing—

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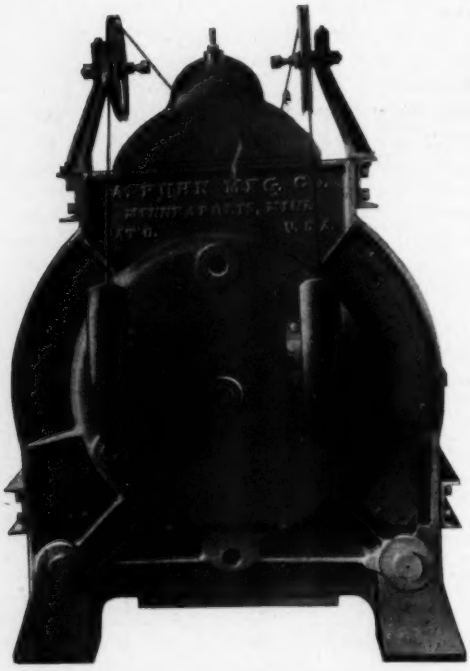
The HUHN SYS



The Rear End View of a Huhn Continuous Starch Dryer

HUHN TRADE CHINOOK MARK DRYER

Production orch
with *oird*
with *oird*
and wi*m*

With a unit installat wo
starch is dried, coole turn
the desired n o

for instance: A plant using 100,000 pounds of starch with the regular dry hod
produce with the Huhn System the same tonnage with 33,000 pounds of starc thir
many boards, with same floor area. Or production can be tripled by running co —th
shifts if desired—because the wet starch which is emptied from the boards is d to
desired degree and the same starch filled with new goods again in the mogul in less inu

With the Huhn System the entire stock of boards are in cast. Better quali is
duced because the starch is always absolutely uniform in temperature and cont

The Huhn System is in use in following pla

The Shotwell Manufacturing Company, Chicago -	(2 Huhn Units)
The Crackerjack Company, Chicago - - - - -	(3 Units)
E. H. Edwards Company, Chicago - - - - -	(1 Unit)
DeLuxe Mallow Company, Chicago - - - - -	(1 Unit)
E. J. Brach & Sons, Chicago - - - - - -	(1 Unit)
Farley Candy Company, Chicago - - - - - -	(1 Unit)
Fred Amend Company, Chicago - - - - - -	(2 Units)
The Campfire Company, Milwaukee and Cambridge -	(3 Units)
Eline's, Inc. (Gum Dept.), Milwaukee - - -	(4 Units)
Kibbe Brothers Company, Springfield, Mass. - -	(1 Unit)
Henry Heide, Inc., New York - - - - -	(1 Unit)

Mason Au Magerheimer Compan -	
Lofts, Inc., New York - - - -	
Dilling & Company, Indianapolis - -	
Hardie Brothers, Pittsburgh - -	
National Candy Co. (Mt. Clemen -	

Catalog sen est

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3915 Hiawatha Ave. eap

lica a method, for many years successful in the flour and
ndu which has now revolutionized the manufacture of
confections cast in starch

Y£M *of* Conditioning Starch

n o rch cast goods can be doubled
n *on rd* the number of boards
n *on rd* the amount of starch
wi *me* floor space as before

tallat wo Huhn machines—a cooler and dryer—the wet
coole turned to buck or mogul in **6 minutes!**—in exactly
sired n of temperature and moisture content.

HUHN TRADE CHINOOK MARK DRYER

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starch third as
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rgh - - (1 Unit)
Clemen - - (1 Unit)

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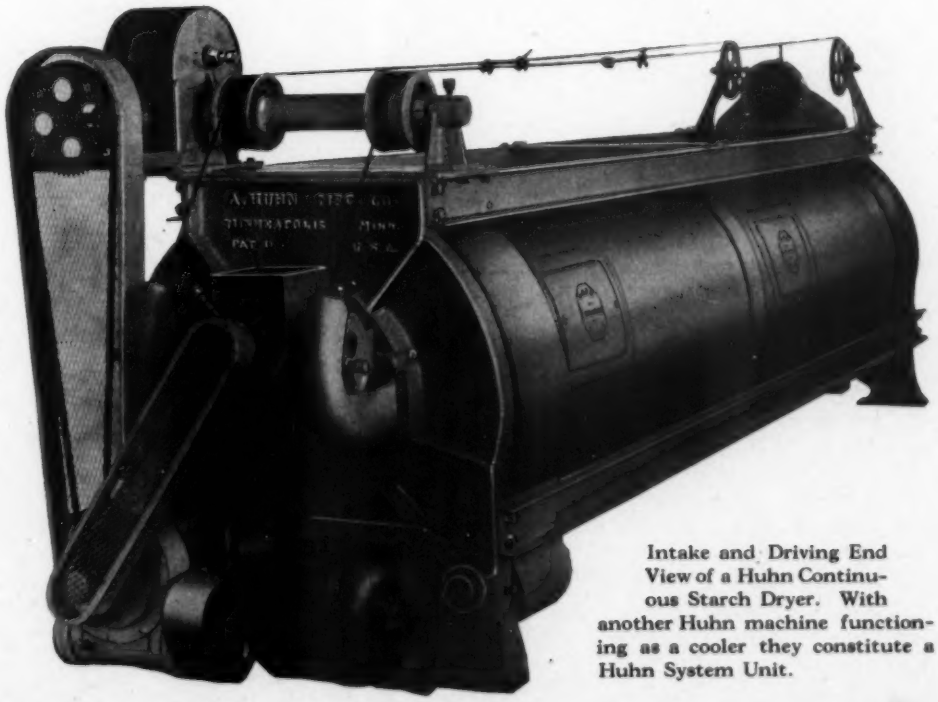


Intake and Driving End View of a Huhn Continuous Starch Dryer. With another Huhn machine functioning as a cooler they constitute a Huhn System Unit.

Methods of Curing Vanilla Beans

and Their Significance in Flavoring Qualities

This series started in September issue with an article entitled "From Montezuma to the Modern Confectionery Factory."

by
A. Adams Lund

Next Issue:
Grading Vanilla

This is the third of a series of articles in preparation of a Hand Book on Confectioners' Raw Materials.

Sun or Hot-Water Cure?

NOW actually, although each process has a number of variations adapted to locality and climate, there are only two methods of curing vanilla, the Mexican, or sun-process, and the Bourbon, or hot-water process. The former takes considerably longer but the results are more than commensurate with the added time and labor involved. The Islanders resorted to the hot-water method out of necessity rather than choice although it is a fact that the element of time-saving has given them a tangible economic advantage. Bourbon vanillas posses thinner skins than their Mexican cousins and hence are unable to with stand protracted exposure to the direct rays of the sun.

The Sun Process

The green pods are spread on straw mats in long orderly rows to take their initial sunning. The village streets in the Mexican vanilla districts provide excellent areas in which to spread the pods at what is evidently a very reasonable rental (?). At all events, they are extensively employed for the purpose. The pods are left in this broiling, tropical sun for about one hour, during which time they attain considerable heat. They are then hastily gathered up to be deposited in a great big "cajon," or sweat box, which has previously been lined with mats or heavy wool blankets. The capacity of a "cajon" will vary anywhere from two thousand to four thousand pounds. The loaded "cajon" is in turn carefully wrapped in mats so that the fermenting beans will retain as much of their heat as possible. In this manner the beans are sweated for from twenty-four to forty-eight hours. (Figures 23-24, inclusive.)

The beans are still warm from their previous sunning when the curer removes them from the "cajon" and arranges them on long wood trays, or "camillas." The "camillas" are taken to the "vainillol" or drying room where they are laid on ventilated racks. Here the beans are allowed to cool off and dry for several days. (Figures 26-28, inclusive.)

This sequence of sunning, sweating and drying (the sweating shortened with each repetition) is repeated a number of times until the beans have lost their surplus moisture and developed satisfactory color and aroma. Toward the early part of March the November gatherings reach the last stage of the cure. They are now placed under observation in a large, tin-lined deposit box, where they are further permitted to age and mature. (Figure 29.)

The later pickings, as they come through the cure, are added to the deposit box from time to time. The middle of May sees the curing of all lots complete, and it remains for the curer to finally pass judgment upon their flavor, texture and general appearance. This done, the beans are graded, sorted to length and bundled ready for packing and shipment.

The "Calorifico"

The oven-cure is an adaptation of the sun process. Originally resorted to only in spells of inclement weather, the oven, or "calorifico," has recently come to be regarded by the more progressive curers as a permanent adjunct to the sun-cure. It requires a certain amount of skill to op-

The Mexican Sun-Cure:

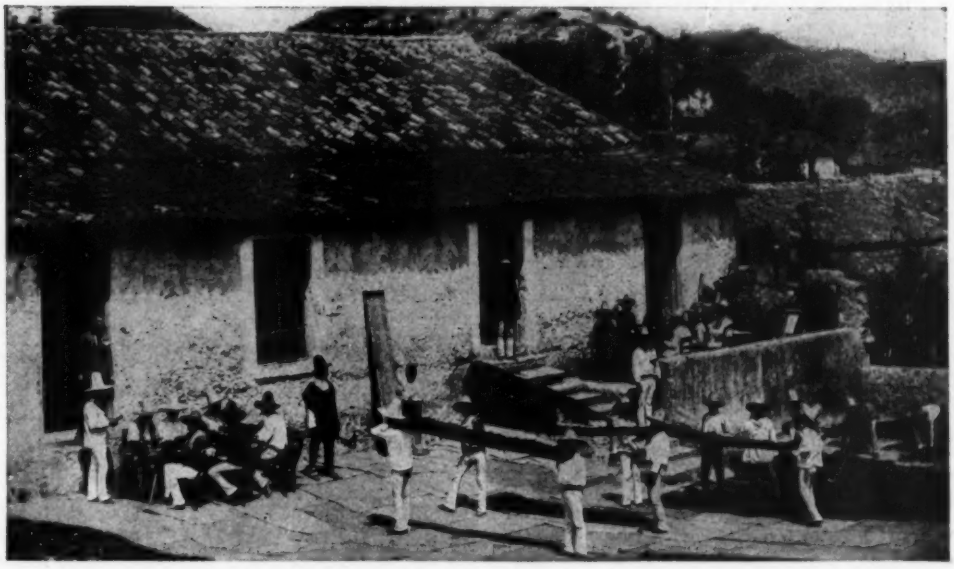


Fig. 9.—Sorting and sun-curing Mexican vanilla beneath the Sierras†

Fig. 10.—Sun-curing Mexican vanilla in the streets.†

erate successfully but produces unusually fine results in perfume and preservation.

Having been pre-heated to about 115 degrees C., the fire is drawn and the furnace carefully swept out. Twenty packages of about 250 to 300 green pods are wrapped securely in woolen cloths and tied in a matting cover to prevent their opening in the oven. They are then set on wooden planks and pushed into the oven. About fourteen hours later a test package is removed and inspected. Ordinarily from sixteen to twenty-four hours are required to complete the work and obtain the desired color. Then the beans are sunned, sweated and dried in accordance with the usual curing routine. (Figures 21 to 29, inclusive.)

†*Photo. Courtesy The W. T. Rawleigh Co.*

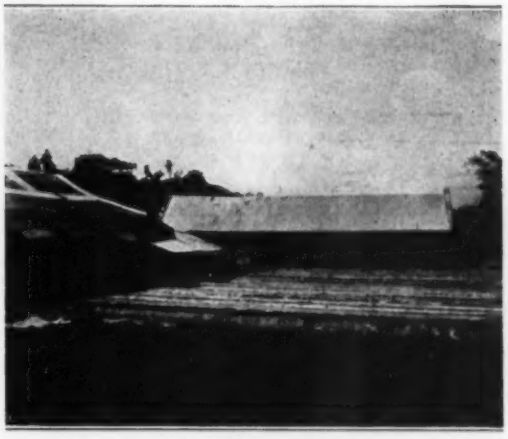
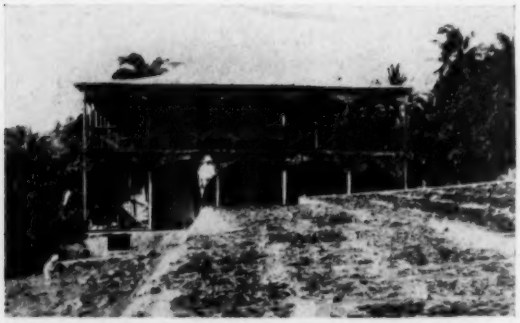


Fig. 13.—Curing Bourbons on a plantation at Moroni (Comoro Island)†

The Hot-Water Process

The Bourbon process resembles the sun-process in the important particulars except that the initial heat is acquired by immersion in hot water and the subsequent drying accomplished by *indirect* sunning. The Green pods are first put in small open-work baskets and immersed in pots of water which have previously been heated to within a few degrees of the boiling point. The immersion is brief, lasting only from 15 to 20 seconds according to the thickness of the skin to be penetrated. Then they are drained on mats; gathered into heaps.

South American Curing:



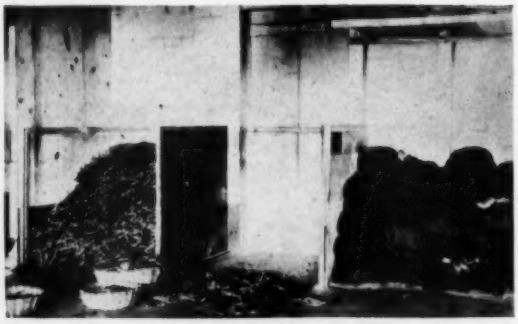


Fig. 14.—(Upper Left)—Heating the pods in the sun prior to sweating (Guadeloupe)*

Fig. 15.—(Upper Right)—Two methods of sweating "South Americans." Left, native; right, American (Guadeloupe)*

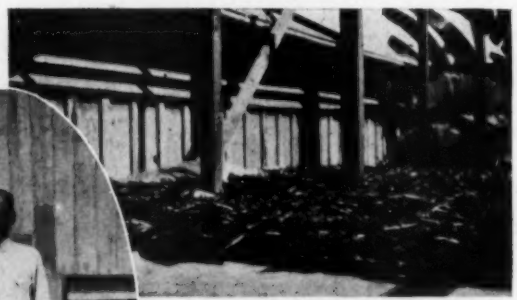
Fig. 16.—(Lower Left)—Gathering up the beans for the drying room after their last stage of sunning (Guadeloupe)*

Fig. 17.—(Lower Right)—A drying room at Guadeloupe

wrapped in cloths and sweated indoors for fifteen minutes. Next they are transferred out-of-doors, covered with an additional layer of brown wool cloth, and left to receive the usual sunning during the hottest part of the day. At night they are gathered up into wool-lined, pre-heated boxes similar in principle to the Mexican cajons, in which they retain their acquired heat most of the night. The duration of the sunning and sweating process depends largely upon the weather conditions and the size and thickness of the beans.

As to the merits of the two processes, no one will deny the finer aroma and keeping quality of the Mexican bean. This result has taken from two to three months longer to attain (Mexicans taking six months to cure and Bourbons three). Properly-cured Mexican vanilla has been known to keep for years steadily

*Photos, Courtesy Dodge & Olcott Co.



How They Do It in Tahiti:

Fig. 19.—(Above)—"Sun" drying in Tahiti, with apologies to Mexico*

Fig. 18.—A Chinese curer of Tahiti

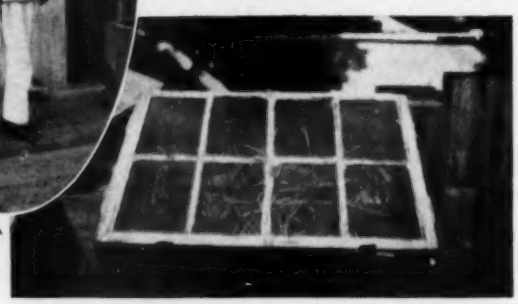


Fig. 20.—(Below)—One of the many native methods of sweating employed in Tahiti*

The Improved Oven-Cure—Mexico:

Fig. 21.—Introducing the Calorifico or vanilla oven (first stage of curing)*

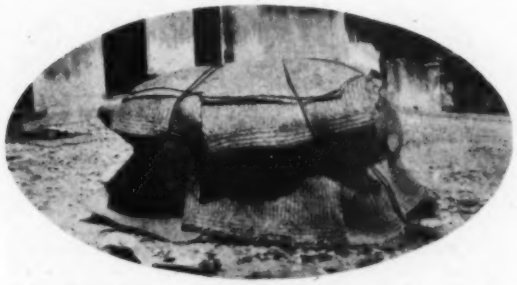


Fig. 25.—The "cajon" securely wrapped to induce fermentation*

Fig. 22.—Exposing the beans to the sun after removal from the oven (second stage of curing)*

Fig. 26.—$250,000 worth of vanilla in center foreground receiving sun-bath following the sweating process. (Fourth stage in the Mexican oven-cure.)*

Fig. 23.—Depositing the beans in the "cajon" or sweat box (third stage)*

Fig. 27.—Gathering the beans up on the "camillas" (wood trays) for removal to the drying room*

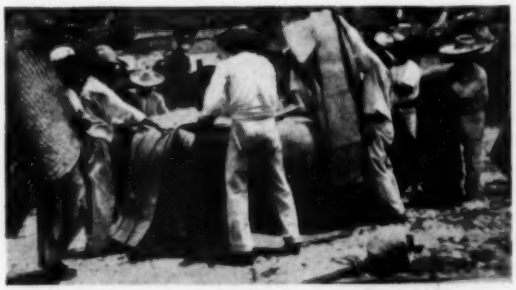


Fig. 24.—The exterior of the sweat box is covered with blankets or straw mats*

Fig. 28.—Interior of the "Vainillo]" or drying room. (Fifth stage of cure)*

**Photos, Courtesy Dodge & Olcott.*

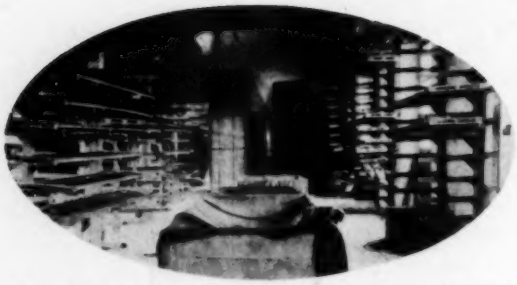


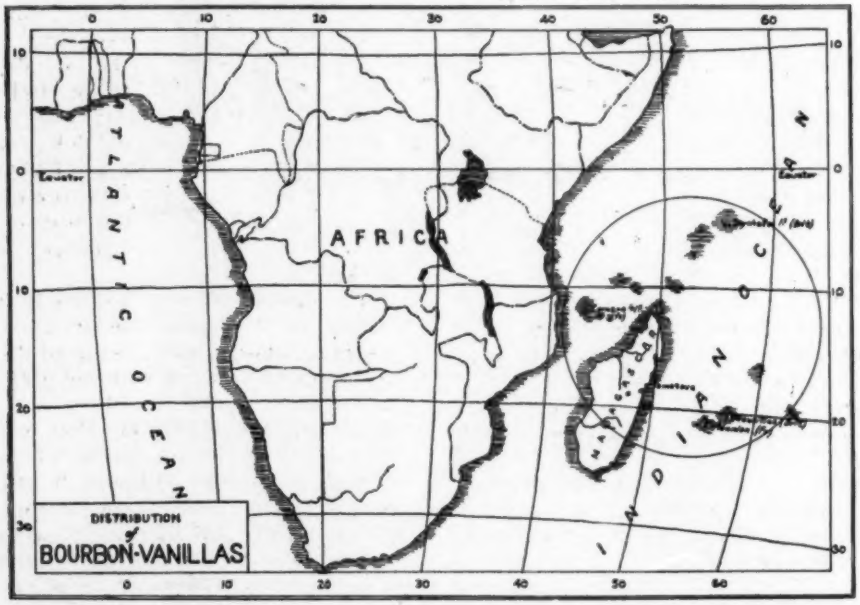
Fig. 29.—After removal from the drying racks, the beans are placed in large, tin-lined deposit boxes to further age and mature. (Final stage of curing)*

developing mellowness of flavor and aroma. Bourbons, on the other hand, may improve for a year or more but sooner or later the inevitable tearing down process begins.

Poorly-cured lots of Mexican vanilla are relatively uncommon. The same cannot be said of any other variety. There is no doubt but that variations in soil and climate contribute substantially to the marked differences in the flavor and keeping quality of the several varieties but it is generally believed that the method of cure and the care exercised in the process have a great deal more to do with these characteristics. The curing of South American vanillas is largely copied after the Mexican process although here and there a few curers resort to immersion. The dominant influence of curing on flavor and preservation is fully exemplified in this variety, where, as the curers gradually overcome the earlier tendencies to over or under-cure, the quality of their production is constantly improving.

Selecting Vanillas for Cure

Human nature being much the same all over the world, we may expect to find ignorance and lust for the added profit interfering seriously in places, with this business of removing excess moisture from the beans. Carelessness or neglect in this direction result in the appearance on the market of many lots which must be recured and reconditioned after their arrival in the states. Unless promptly cared for, such lots are likely to mould or become sour or mited. The fermenting pods heat up, and in a short time, decay and become absolutely worthless. Too much care cannot be directed to this point in the buying of vanilla.



(*Next installment*: The Grading and Packing of Vanilla, with grading charts for permanent reference.)

Research on Packing of Stick Candy*

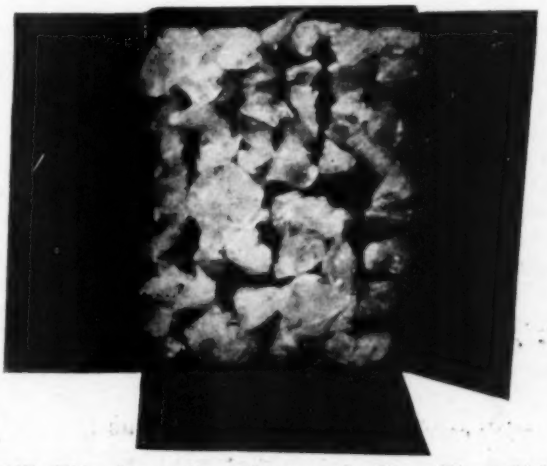
How losses in sales, damaged goods and good will were stopped by proper packing methods

[In this case the candy buyer made the complaint to the American Railway Association who in turn enlisted the cooperation of the packing engineers and container testing facilities of the Paperboard Industries Association. Read the findings of this interesting investigation.]

by C. M. Bonnett, Jr.

Engineer, Freight Container Bureau, American Railway Association

A CHAIN store corporation wrote to us in February, 1926, in regard to the abnormally high rate of damage to shipments of large stick candy from a certain shipper in the middle west, requesting us to make a study of the problem and to submit recommendations for packing. The chain store had been reminded of the condition by a middle western railroad which had been paying more claims on the shipments.



204C—This picture shows the type of cells or fillers which were used in Series B and C tests.

Upon receipt of the request, the railroad company was asked for further specific information to which they replied in part, "The packages are transported and delivered to the stores in apparent good condition, but when they open the containers, the sticks of candy inside the cartons are found broken." The chairman of the Joint Committee of Cooperation of the Freight Container Bureau, authorized us to proceed with this work and the following is a summary of the work done together with the recommendations regarding packing.

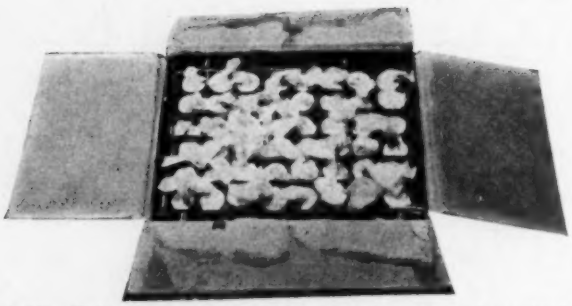
Visits to Candy Manufacturing Plants

Two visits were made to the plant from which shipments were causing trouble. This manufacturer knew that shipments of his ten-cent size stick candy were being damaged in transit; he was glad to welcome outside assistance in the problem and thus extended his sincere cooperation. The ten-cent stick is about 1¼ inches in diameter by 12 inches long and weighs approximately ½ pound. Smaller sticks of candy were being shipped without excessive breakage, but the production of the large sticks was dependent to a great extent upon delivery of the product intact and the manufacturer was particularly desirous of finding a satisfactory method of packing.

The manufacturers had used a wooden box in which 240 ten-cent sticks were packed, this package being later replaced by a corrugted strawboard box containing 120 sticks. Both containers caused trouble which indicated that the trouble was possibly due to insufficient inside packing. Then the number of sticks per outside box was reduced to 48, these being packed in a center special single-wall corrugated strawboard box of 175 pound Mullen test. An inside liner of test stock corrugated strawboard was provided, each stick being placed in a cell of a filled inside the liner. The cells were made of test stock corrugated strawboard and the arrangement of cells was as shown in illustration No. 204C.

Several visits were made to other stick candy factories located in the middle west to learn whether they made the ten-cent size sticks and

*Data and illustrations furnished courtesy of *Packing and Shipping.*



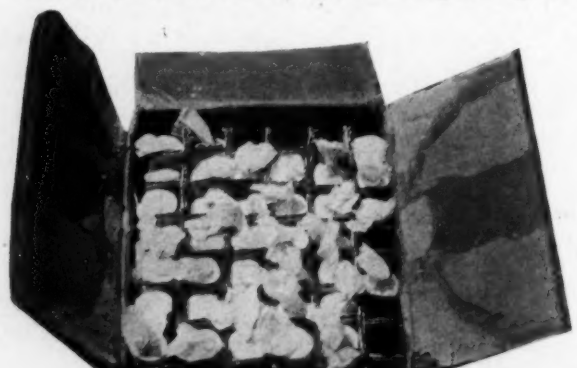
219B—This picture shows box No. A-2 after it had received fifty drops in the revolving box testing drum.

to observe the method of packing. The largest made by most of the plants was a five-cent stick and very little trouble was being experienced in the shipment of these. Two of the companies that were visited made ten-cent sticks but they did not ship in sufficient quantity to be able to give much valuable information over that obtained at the plant where trouble was occurring.

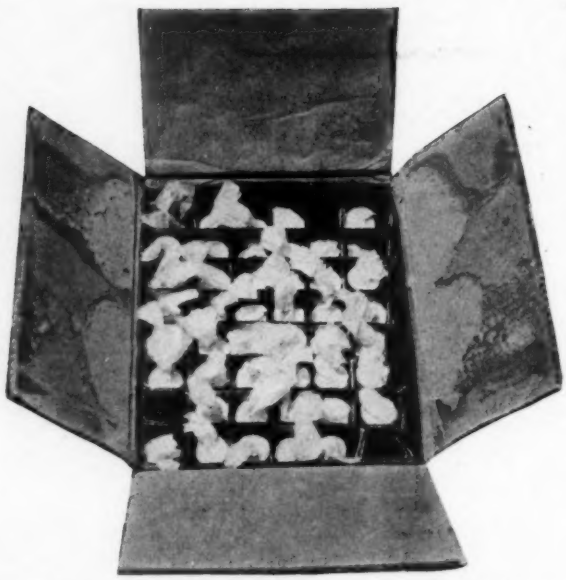
One of these shippers packed fifty sticks in a regular slotted carton type corrugated strawboard box, nine sticks per layer arranged eight sticks lengthwise and one crosswise per layer. This made five full layers and one partial layer of five sticks, each layer being separated by single faced corrugated strawboard pads; both the bottom and top of box was cushioned by about one inch thickness of loose excelsior. Adjacent sticks in the same layer were not separated from one another except by the thin paper in which each stick was wrapped.

Laboratory Packing Tests Necessary

The visit to the various stick candy factories did not disclose much information regarding the

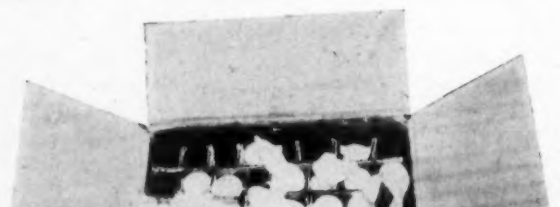


223B—Shows the condition of B-4 at the end of fifty drops.

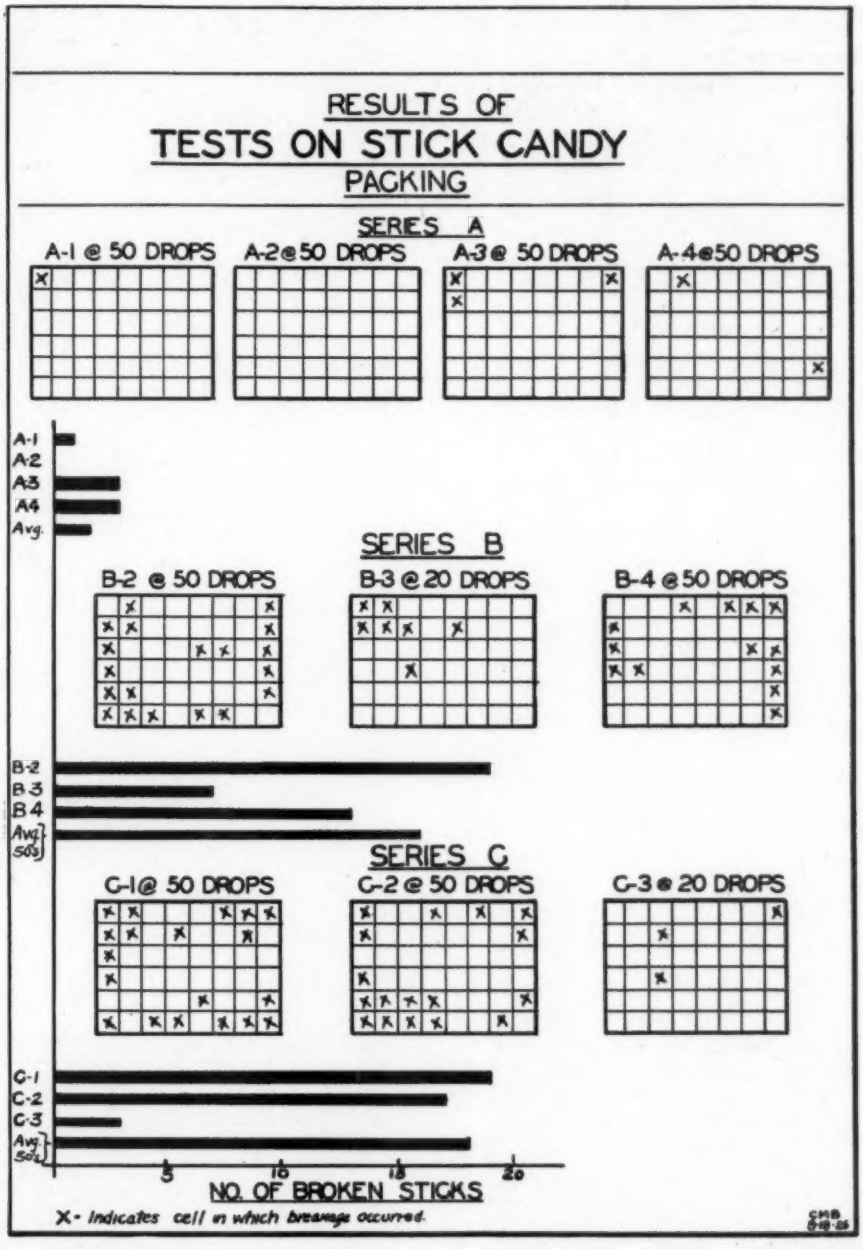


221B—This shows the inside of box A-4 after fifty drops. Note that three sticks were broken and the location of each.

packing of large size stick candy that would permit us to soundly inform a manufacturer as to how to pack his stick candy. It was, therefore, decided to arrange a series of laboratory tests on the packing of the commodity. The container being used by the company at that time was a single-wall corrugated strawboard box of the center special type in which the inner flaps as well as the outer flaps meet at the center and as it was the shipper's desire to continue using a fiber box we approached the association of container manufacturers representing this industry to solicit their cooperation in conducting the tests. They were in accord with the plan and allowed us the use of their testing laboratories at Rockaway, N. J., to conduct the tests.



225B—Shows the breakage in C-1 after fifty drops.



Results of Test Shipments

Boxes of ten-cent stick candy furnished by the interested manufacturer in the middle west.

The first box received was made of single-wall-corrugated strawboard, 175 pound Mullen test, center special type with liner and fillers of double-faced corrugated strawboard. This was shipped by express from Cleveland to Chicago, then Chicago to New York, arriving at New York with three sticks broken, all being in the outside cells of the filler. The box was reshipped to Rockaway, N. J., flaps securely glued and entire package wrapped in heavy kraft paper, tied on, and arrived with two additional sticks broken in the outside cells.

Four other boxes of forty-eight sticks each were shipped from Cleveland to Rockaway, N. J., by express. These were double-wall corrugated strawboard, 200 pound Mullen test, center special type with double-faced corrugated strawboard fillers. Flaps were silicated and the top and bottom flaps taped with 2½ inch kraft tape across the top and bottom and extending about 4 inches over the ends.

There was no breakage in any of the boxes upon arrival at Rockaway.

Additional corrugated strawboard boxes and inside packing was furnished by the company, from whom the candy manufacturer now purchases its containers. The Paperboard Industries Association Research Laboratory at Chicago also furnished several corrugated strawboard boxes.

Types of Containers Tested

SERIES A—

Double-wall corrugated strawboard, center special.
200 pound Mullen test, 65 inch, 65 pound limits.
Liners for double-wall corrugated: Jute—Jute—Jute.
Box had offset scores.
Three inch cloth tape at body joint.
Inside dimensions (length-width-depth) 13 13/16" x 10 11/16" x 12⅜".
Fillers or cells: Single-wall corrugated, chip and chip liners, .0009" with filler tips providing air space ½ inch between walls of box and the sticks of candy. See picture 219B.
Dimensions fillers overall: 13¾" x 10½" x 12¼".
Filler cells: 1⅜" x 1⅜", arranged 8 x 6.
Fillers: A-1, A-2, A-3, had corrugations horizontal.
Fillers: A-4 had corrugations vertical.
Gross weight: 28¾ pounds.
Four boxes tested:

SERIES B—

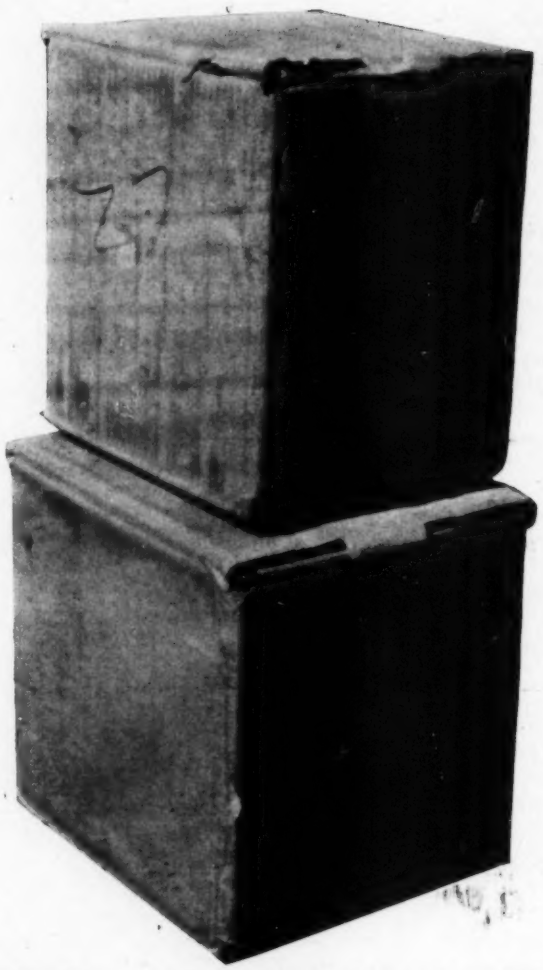
Double wall corrugated strawboard, regular slotted carton.
Pad, 3 inches wide of same materials as box inserted between ends of inner flaps.
20 pound Mullen test, 65 inch, 65 pound limits.
Liners for double wall corrugated: Jute—Chip—Jute.
Box had offset scores.
Three inch cloth tape at body joint.
Inside dimensions: 13" x 9⅝" x 12½".
Fillers or cells: Single-wall corrugated, chip and chip liners, .0009 inch, without filler tips.
Dimensions fillers overall: 12¼" x 9⅛" x 2¼".
Filler cellers: 1⅜" x 1⅜", arranged 8 x 6.
Filler corrugations: all vertical.
Gross weight: 27½ pounds.
Three boxes tested.

SERIES C—

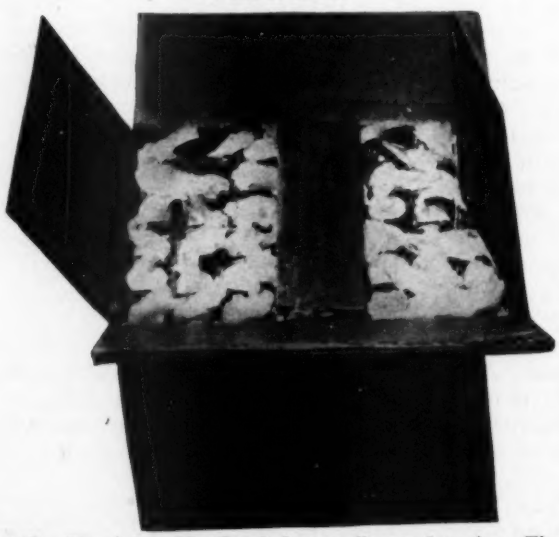
Double-wall corrugated strawboard, center special.
200 pounds Mullen test, 65 inch, 65 pound limits.
Liners for double wall corrugated: Jute—Jute—Jute.
Box had offset scores.
Three inch cloth tape at body joint.
Inside dimensions: 12-7/16" x 5/16" x 12⅜".
Filler cells, 1⅜" x 1⅜", arranged 8 x 6.
Filler corrugations: all vertical.
Gross weight: 28 pounds.
Three boxes tested.

Closing of All Containers Used

THE flaps of each container were first sealed with silicate of soda (Philadelphia Quartz Company, "Seal Brand") then a strip of 3 inch, 60 pound kraft tape was placed over the



228B—Shows the comparison in size between boxes in the C and A series.



222B—Shows box No. B-2 before sealing and testing. The picture shows the three inch pad that was placed between the ends of the inner flaps which do not meet because the box is of the regular slotted carton type.

joint at the outer flaps lengthwise across the top and bottom and extending about four inches over the ends.

Tests Made at Rockaway

The tests were made at Rockaway, N. J., on August 9, 1926.

Each box was tested in a 14-foot revolving box testing machine. This is a hexagonal shaped drum on the inside of which on each of the six faces are certain obstructions called hazards that cause the container placed therein to drop, fall, or roll on its sides, top, bottom, corners or edges in a regular cycle, thus simulating the actual conditions which any container is liable to encounter in transit. The drum rotates at a speed of one revolution per minute giving the observer time enough to note the occurrence of and possible cause of failures and to record notes pertaining thereto. By testing first one box and then another and recording the total number of drops together with the number of and types of failures one box can readily be compared with another.

Boxes to be tested were numbered as follows:

Series A—A-1, A-2, A-3, A-4
Series B—B-2, B-3, B-4
Series C—C-1, C-2, C-3

Findings of the Investigation

The accompanying chart illustrates graphically the amount of and exact location of breakage that occurred in testing.

It will be noted that the boxes containing cells or fillers with one-half inch air space showed the best results in the tests, the average breakage at the end of fifty drops being 1¼ sticks whereas the average for the boxes in the B and C series were 16 sticks and 18 sticks respectively at fifty drops. It is true that fifty drops in the drum is the equivalent of more than ordinary handling in transit and it is not intended that the containers should stand up under such punishment. The reason for doing this was to obtain enough breakage in the better boxes so that some basis of comparison could be established.

In test A-3 at the end of the twentieth drop, the box was opened and inspected for breakage, but none was found so the container was resealed and tested to fifty drops. The same procedure was followed in the case of tests B-3 and C-3 except that these boxes were not resealed and tested beyond twenty drops as sufficient breakage was found at this stage to indicate that the containers were hardly efficient enough to withstand the ordinary handling in transportation. In all of the tests, even those boxes tested to fifty drops, the outside of the containers were in fairly good condition and the inexperienced observer would undoubtedly assume that because of this outside appearance, the contents would be in good condition.

Picture 224B shows the condition of the box in test B-3 after twenty drops in the drum and before opening to inspect for damage. This picture also illustrates the method of sealing with paper tape.

Puncture hazards in the drum did not seem to cause any trouble in all of the tests that were made, although each box received an average of about two punctures. No breakage of sticks was found inside at points adjacent to punctures so it would seem that this is a relatively unimportant hazard for stick candy packed in a double wall corrugated strawboard box.

The box in test A-4 differed from those in A-1, A-2 and A-3, in that the corrugations in fillers or cells of A-4 were placed vertical while those in other tests of the A series, also the B and C series were horizontal. Taking the data from the A series alone, it might be concluded that the results show the horizontal corrugations to be the better. We do not feel that this conclusions can be safely drawn as in this series only one box was tested with filler corrugations vertical against three boxes with the filler corrugations horizontal.

Practical the only difference between the B and C series was the fact that series B containers were of the regular slotted carton type fiber box with a small pad to fill in between the ends of the inner flaps while series C were of a center special type in which both the inner and cutter flaps met. A further difference existed in that the inside dimensions (length and width) of series B containers were slightly larger than those of series C. While there was considerably more loose space lengthwise and crosswise inside the series B boxes at the conclusion of each test, the results do not indicate that this slight variation made much, if any difference. The series B box probably had a slightly lower initial cost than series C but its manipulation in the packing room while being packed would probably cause more care to be exercised than with series C and this would add to the final cost of the series B container.

Recommendations

The use of containers and inside packing as in series A tests is recommended for safely shipping large size stick candy similar to that described herein.

"Greater Returns from Human Capital"

—in four parts—

Unmined Gold in the Rank and File

written exclusively for The Manufacturing Confectioner

By Seth Seiders

President, Seth Seiders, Inc.

A CHICAGO publisher issues at regular intervals a million booklets which require a special width of paper stock. Each issue takes a carload of paper, which a mill in a Middle Western state makes to specifications.

Not long ago when a shipment of the paper arrived at the publisher's receiving room it was discovered that the whole lot had been cut an inch too narrow.

The purchasing agent got the general manager of the mill on the long distance telephone.

"This is a nice piece of work," he thundered. "This paper's off size, and here it is, only a day ahead of press date. What are you going to do about it?"

After he regained his breath, the mill manager apologized abjectly and assured the purchasing agent that the mill would be glad to do anything in its power to make amends. He suggested that the publisher get what he could out of the shipment, enough paper would be rushed to make up the shortage and the mill would stand the extra expense involved in the print shop.

Inasmuch as the time was so short, there was nothing else to do. It was necessary to cut off and throw away a strip of paper several inches wide, the length of each sheet, and to make an extra press run. The mill took a loss of nearly half the invoiced price of the paper.

Who was responsible for the error? Investigation disclosed that a machine operator in the mill hadn't taken the time to verify the width specification.

"Never mind looking it up," he had said to a helper. "It's the regular stuff for the Blank people—thirty-four inches."

The specifications, which he did not consult, called for a width of thirty-five inches. If he had examined the instructions, instead of leaving the job to guesswork, the mill would not have suffered a loss of several hundred dollars and he would still have the confidence of his superiors.

In other words, he traded his standing with the firm for half a minute of time. He "took a chance," just as he probably had taken a hundred chances before—but this time fortune did not smile upon him.

Let us contrast this incident with one that occurred a few months ago in a large confectionery manufacturing plant.

An accident to a water pipe threatened to deluge 10,000 cartons. A worker, discovering the danger, shouted to his foreman, an emergency crew was mobilized and the boxes were moved to a safe place in record time.

"Great Caesar," exclaimed an observer, "I never in my life saw a bunch of men work so fast! They must expect you to take care of them in their next pay envelopes."

"No," smiled the superintendent, "we're sold around here on the proposition that prosperity is about a fifty-fifty split."

"What do you mean by that?" the superintendent was asked.

"Well," he replied, "we've got to the point where all of us understand that the more this firm makes, the better it is, not only for the stockholders, but for us. No profits, no payroll. That's simple enough."

The water from the damaged pipe might not have reached the boxes, but neither the worker who discovered the danger, nor the foreman who called the men away from their regular work to move the goods to a place of safety was willing to "take a chance." They thought of 10,000 water-soaked cartons in terms of that much money wasted—that much taken from the firm's earnings—steady work at good wages jeopardized.

If the paper mill worker had figured waste on that basis, he would have taken the time to make sure of his instructions before he set his machine to turn out a carload of the product.

The secret of the difference in attitude of the workers in the two plants lay in the fact that the management of the confectionery enterprise had provided its people with a mental stimulant which took care not only of emergencies of the kind just mentioned, but provided an inspiration and a *reason* for intelligent, careful, "heads up" work, week after week. It had, in short, sold them on the fact that the more effectively they served the firm, the more effectively they

served their own interests. Each worker had come to see the advantage to himself of being constantly on the alert for "leaks," continually looking for ways and means of doing the work better or more economically, eager to "team up" with his fellow workers, to the end that they might move forward *as a unit*.

An understanding such as this is the "unmined gold in the rank and file," and its discovery and development is the greatest problem—and one of the most fruitful sources of additional profit—in industry today. For the wastes traceable to the human element are, as we have said before in these articles, as great, if not greater than all other losses combined.

The average worker in the average organization takes the "I don't care" or the "Oh, what's the use?" attitude. It isn't *his* factory, it isn't *his* product, it isn't *his* personal profit or loss. So why, he argues, should he extend himself to give that overplus of effort which distinguishes superlative performance from the kind that "gets by"? He is there, he reasons, to give eight, nine, or ten hours' work in return for a stated sum in his pay envelope, and, the longer he stays, the more he will receive, because "raises" are to be expected as a matter of course from time to time. So, as long as "the boss" is satisfied, why should anyone worry?

This attitude manifests itself in a long train of evils, each of which takes its money toll in the form of increased operating expense. Some of these evils were mentioned in the preceding articles in this series. Let us now consider a few others and inquire into their cost.

The common experience of employers proves that it is a corollary that where the worker is not sold on his job—where he has not been shown that it offers him his best opportunity to build a future for himself—he is either actively or passively on the look out for another connection. This is the principal source of labor turnover—one of the costliest items of expense in conducting a business, as the reader will easily recognize by multiplying the number of acquisitions and separations in his organization during the last year by the cost of hiring and training a new worker. The average figure is $50—an amount which varies considerably, of course, with individual enterprises.

An evil which goes hand in hand with labor turnover is avoidable absentism—the worker's tendency to "lay off" just because he happens to feel like it. The cost of this practice is measured in the inevitable interruption of the smooth operation of a group or department. Both quantity and quality suffer—if not because of the lack of skill of a worker substituting on the job, then because of the added speed which the remainder of the group must make in order to keep the schedule.

LURKING LEAKS

Wastes, due to wrong thinking on the part of the human element in any business, may be small when considered individually, but when multiplied by the number of times they occur in a week or a month, they pile up a total in the course of a year which no concern can afford. Profits leak away like grain through the hole in the farmer's wagon.

Along with high labor turnover and absentism go tardiness and loafing, each of which likewise is directly due to lack of interest in the work. The man or woman who has been sold on his job is in his place when work starts in the morning, no matter whether he lives some distance from the factory or not. He is out to make the best showing he can, and he knows that "five minutes late," appearing, even infrequently, on his record, is not conducive to his progress with the firm. Neither does he fritter away his time during working hours. Loafing cuts down his results—and results are what he is after.

Now, the cost of a worker's being a few minutes late in the morning, or of wasting five or ten minutes three or four times a day in loafing, is not so much when considered by itself. But when it is multiplied by the number of times it occurs in a day or week and again by the number of workers tardy or loafing, it mounts to a big figure in the course of a year. An eastern confectionery manufacturer was surprised, a year or so ago, to find that tardiness and loafing alone were costing him in the neighborhood of $1,800 a year in wages. And the loss came home to him with still greater directness when it was pointed out to him that $1,800 represented the interest, at 6 per cent, on $30,000. In other words, these two evils which he had always regarded as trifling, had reduced his borrowing power by $30,000!

Only a Rumor—But

Another negative human tendency which finds full play in the worker who has not been

SHOULDER TO SHOULDER

The most valuable players on a baseball team are not those who play to the grandstand, for individual glory, but those who play for the team. So it is in a business organization. The most valuable workers are those who think of, and work for, the group, the department and the business as a unit. Selling employees on the fact that they progress only as the firm progresses is a sure way to build teamwork.

sold on his job is susceptibility to rumors. And there is no one thing which can cause more money loss to an organization than a rumor of impending changes which would work to the detriment of employes. There is always a let-down in effort, and this usually is accompanied by the loss of a number of workers, who hunt other jobs at the first sign of trouble.

We have in mind a sizable Middle Western plant, where a report gained circulation that, owing to a slump in the market, a half-day working schedule was shortly to be inaugurated. There was no truth in the rumor, but it took the concern ten days to two weeks to allay the employes' fears—during which period there was a decrease of 8 per cent in production, at a net cost of more than $6,000. In addition to which, more than 50 workers quit. It had cost the firm $60 each to hire and train these employes—which means that $3,000 more of loss was added to the $6,000. Nine thousand dollars is a good deal of money to spend in quieting idle gossip.

If, through a process of education, the firm had put its workers properly on guard against reports of this kind, that $9,000 would have been saved, and the services of the 50 employes retained. More than half of these were extremely hard to replace.

Workers who have no enthusiasm for the firm and their opportunity with it will not offer suggestions for the betterment of the business. Herein lie potentialities for unlimited profits, as may be seen from the following facts:

A worker in a central New York lumber finishing mill came to the superintendent two years ago with the suggestion that some profitable use might be made of wagonload after wagonload of odds and ends left over after the standard sizes had been cut. Out of that suggestion came a sideline of radio cases on which the mill this year will realize a profit of several thousands of dollars.

Fifteen employes of a Kentucky lumber yard visited the owner in a body and told him they believed customers could be served just as well if stock on hand were reduced from $75,000 to $45,000. They had been talking it over among themselves—indeed, had figured it all out—and they presented him with a schedule of sizes and kinds which they thought could be greatly reduced. After checking the schedule in the yards, the dealer adopted it substantially as presented—at a huge profit to himself.

An Eastern textile concern last year added more than $42,000 to its income through the adoption of the suggestion by an employe for improving one process. A paper bag mill in the South saved more than $50,000 in a similar manner; and a California motor parts maker, quick to put into practice an idea of a clerk in his shipping department, has lopped $14,000 annually from production costs.

These are not isolated cases. The same thing is going on throughout industry. But it is going on only in enterprises where the workers have been educated to think along with the head of the business—putting their hearts and minds, as well as their hands, into their work—"thinking beyond their jobs"—because they have been brought to realize that, in the last analysis, their interests and those of the firm are one and inseparable, and that they contribute best to their own welfare and progress by contributing to the welfare and progress of the firm.

Lack of space prevents our going into a large number of other human tendencies, each of which adds to costs. Among these tendencies are ignorance of the job, a misconception of the logic of business, "knocking," suspicion, discourtesy, worry, anger, aimlessness, surliness, bluffing, sluggishness, obstinacy, self-distrust, lack of ambition, thoughtlessness, excuses, guessing, indirection, buckpassing and a score of others. Each of these has been acquired either from the worker's particular environment or through wrong habits of thought, and they can be dealt with only through education.

Now, what must be the purpose of this process of education? Its purpose must be the creation of greater individual responsibility through a heightened sense of self-respect on the part of the worker. And the heightened

sense of self-respect must be born of the worker's appreciation of his own importance in the organization and the necessity of his first perfecting himself and then cooperating intelligently with every other member of the organization, so that all may progress. In other words, he must come to think not "I," but "We."

He must be shown *how* to perfect himself, and to cooperate. He must be shown *how* to overcome his shortcomings. He must be shown *how* to substitute positive, constructive thinking, for negative, destructive thinking. When he begins thinking constructively, he begins to be a broader man, begins to look ahead, begins to manage himself to his own best advantage—and that always is to the advantage of the organization of which he is a member.

Obviously, such an educational campaign cannot very well be carried out in a day, nor single-handed. The time element must be considered—time in which new ideas to replace the old can be given a foothold and be brought to the point of actual character-building influences. And the "single-handed" reference is of course to the need for adequate facilities and resources; for a basis of activities that will not be prohibitive in the money and effort cost involved.

In short, re-education of any working force out of a dominating condition of mental negatives and over into a dominating condition of mental positives calls for the services of the specialist outsider, equipped by experience, personnel and record of actual accomplishment to do such work in minimum time and at minimum expense for maximum effectiveness of results.

Such an organization (as the experience of thousands of large and small concerns in all lines of industry has proved) can bring to the negative-practice problem of the individual firm the ability it has accumulated in the solution of identical problems for other firms. Its plans have the benefit of a height, width and depth of experience absolutely unavailable to the manufacturer who would attempt to do the job himself; while the simultaneous serving of many hundreds of clients decreases the cost to each client by putting it on a "volume" basis.

The principle employed? It is that which has stood in good stead America's foremost manufacturers, merchants and leaders of movements—that of broadcasting through text and picture, precisely those ideas and that type of suggestion which will most satisfactorily replace the negative old with the positive new.

Applying the methods of advertising to human management problems inside specific organizations has, in fact, proved a revelation in added profits, added output, added quality of production, added good will, added cooperation and the added impetus which enables any firm to pull ahead of its industrial rivals.

BLIND ALLEYS.

The worker who has little or no interest in his job is like the motorist who can go no farther because the road is closed. For both, the way to progress is blocked. There is one way to clear the obstruction for the worker, and thus make his ability useful to the firm, and that is to kindle his enthusiasm for his work by showing him that it is to his advantage to put his heart into it.

But, as already stated, it is only best done, because only most feasible, effective and least expensive, when placed in the hands of skilled outsiders whose entire efforts are focussed on that particular type of thing.

Once committed to such an organization, the task of re-education imposes practically no additional detail on the firm's executives—and so little added expense as to be actually negligible in comparison with the results achieved. Redeeming "the unmined gold in the rank and file" is indeed today a process of industrial reclamation of human energy beside which the Government's greatest reforestation and land reclamation projects pale into insignificance—for if the single negative of Careless Waste alone were thus successfully ended, the profits, to American business, would total many billions of dollars annually!

What, then, let us try to imagine, would be the fruit of such work, if ALL the "destructive practices" in the single industry of confectionery manufacture, for example, could be elimiinated by this reconstructive means which is easily within the reach of the very smallest individual operator?

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of direct or indirect relationship to the confectionery industry

Experiments in the Fermentation of Cacao. By W. A. Knapp. J. Soc. Chem. Ind., V. 45, P. 140-2T (1926). The influence of the following factors upon the fermentation of the cacao bean was tested: (1) the condition of ripeness of the cacao, (2) the influence of ethyl alcohol, (3) the effect of addition of diatase, and (4) the effect of addition of water. Conclusions: unripe pulp contains less sugar; hence insufficient heat is developed for good fermentation, thus producing an inferior product. Over-ripe beans produce satisfactory fermentation, but if over-ripeness has advanced as far as germination, the flavor and keeping properties are spoiled. Ethyl alcohol hastened the color changes associated with fermentation; diatase permitted more rapid removal of pulp; addition of water was followed by increase in temperature, but none of these latter factors appreciably affected the final product.

Foreign Trade Studies. Two Trade Information Bulletins have been recently completed and released for distribution by the Department of Commerce:

The first, T. I. B. No. 409—Newfoundland: A Commercial and Industrial Survey—is a booklet of 62 pages, giving valuable information on economic conditions in Newfoundland, with descriptions of its resources, industries and recent growth.

The second, T. I. B. No. 410, is a 40-page discussion of the "Resources and Trade of Philippine Islands." Copies of these bulletins are available from the Department of Commerce, Washington, D. C.

Better Marketing of Peanuts. In an affort to stimulate the sale of peanuts in both domestic and foreign trade, the Department of Agriculture has prepared Department Bulletin 1401-D, on the "Marketing of Peanuts."

In this booklet are described the commercial types of peanuts grown in the United States, the uses and distribution of the various types, and a number of ways in which peanut sales can probably be increased. For copies of this work write the Department of Agriculture, Washington, D. C.

New Division in Federal Trade Commission. The Federal Trade Commission announces the establishment of a new division known as the Division of Trade Practice Conference. In this division will be co-ordinated and facilitated all work incidental to holding conferences with representatives of industries for the purpose of aiding such industries in the adoption of rules of business conduct looking to the elimination of unfair and illegal practices.

The new division will be manned by trained employes already on the rolls, and will take over the trade conference work which has been heretofore scattered among several divisions. A number of conferences have been held and a pamphlet covering them published. Copies of the booklet explaining the work of the commission along this line may be obtained from the Federal Trade Commission, or through the Associated Advertising Clubs of the World, Suite 427, Commerce Bldg., Washington, D. C.

Heat Resistance of Vitamins. E. F. Kohman of Washington, D. C., in an address before the annual meeting of the American Chemical Society. Many confectioners have considered the advisability of producing confections having a certain vitamin content, but have been deterred from undertaking such manufacture because of the prevalent belief that heat destroyed the vitamins. Mr. Kohman, in addressing the annual meeting of the American Chemical Society, states that vitamin C, the one which prevents scurvy, has been most commonly supposed to be injured by cooking, but vitamin A, which insures normal growth, has also been included in the list. The damage was supposed to result from the combination of the vitamin with oxygen from the air at high temperatures, but in tests conducted by Mr. Kohman, he was unable to confirm these suppositions. "The only experimental evidence in the literature that vitamin A is destroyed by oxidation is in connection with fats when they are directly exposed to the air in shallow layers while being heated," said Mr. Kohman. "This condition is scarcely ever met with in the handling of foods. There is an abundance of evidence that vitamin A is not destroyed by oxidation in the general handling of food products. Live steam has been passed through butter fat for six hours with no loss of vitamin A. Steenbock and Boutwell heated yellow corn, chard, carrots, sweet potatoes, squash, and alfalfa under pressure for three hours at 248 degrees Fahrenheit with no destruction of vitamin A being evident. It is possible that vitamin A might be destroyed under these conditions if oxygen were actually bubbled through them. But within the conditions of handling foods, it might safely be stated that vitamin A is not oxidized when subjected to heat."

Vitamin D, the substance in milk that prevents rickets (a disease of the bones), is increased when the milk is exposed to ultra-violet light, invisible rays given off by the sun and some mercury vapor arc lamps. However, it is not likely that dairies will begin to use ultra-violet light on their products, for vitamin A (the substance that insures normal growth) is destroyed by this process.

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